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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. | | | | |
|--|---------------|---|---------------------|------------------|-----------|---------------|--------------|-------|
| 10/642,914 | 08/18/2003 | Liexiang Fan | 2003P08374US | 3652 | | | | |
| 7590 01/17/2008 | | | | | | | | |
| Siemens Corporation Intellectual Property Department 170 Wood Avenue South Iselin, NJ 08830 | | <table border="1"><tr><td colspan="2">EXAMINER</td></tr><tr><td colspan="2">KIM, CHONG R</td></tr></table> | | | EXAMINER | | KIM, CHONG R | |
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| | | <table border="1"><tr><td>ART UNIT</td><td>PAPER NUMBER</td></tr><tr><td>2624</td><td></td></tr></table> | | | ART UNIT | PAPER NUMBER | 2624 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/642,914 | | FAN ET AL. | |
| | Examiner | | Art Unit | |
| | Charles Kim | | 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-10 is/are allowed.
- 6) ☒ Claim(s) 1-4, 11, 13-16 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 12, 17 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 2, 2007 has been entered.

Response to Amendment and Arguments

2. Applicant's amendment filed on November 2, 2007 has been entered and made of record.
3. Applicant's arguments with respect to the rejected claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 11, 16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawaguchi et al., U.S. Patent No. 5,677,501 (hereinafter "Kawaguchi") and Yoshiya et al., J.P. Patent No. 02-161934 (hereinafter "Yoshiya").

Referring to claim 1, Kawaguchi discloses a method for representing flow, the method comprising:

- a. determining a rate of change of a parameter as a function of a difference in time between first and second images associated with different times [col. 1, ll. 51-col. 2, ll. 37 and col. 6, ll. 18-52];
- b. calculating a positional change in the parameter between the first and second images associated with different times, the positional change being displayed as a function [of] the rate of change and being a function of the difference in time [col. 5, ll. 17-col. 6, ll. 2. Note that the positional change is displayed by the offset in the pattern between selected flow images (see figs. 2-3), wherein the flow images are selected as a function of the polarity and magnitude of the input signal. In addition, the speed of the flow image selection process, i.e., difference in time between the images, is based on the magnitude of flow of the input signal (see col. 6, ll. 18-52).]; and
- c. displaying the change in the parameter in the second image [col. 5, ll. 54-col. 6, ll. 52. Note that the calculated change in the parameter is displayed by shifting the pattern (figs. 2-3) in an upward or downward direction, depending on the polarity of the input signal. Moreover, the speed in which the pattern is shifted depends on the magnitude of the input signal, as explained above.].

Kawaguchi does not explicitly disclose that the method for representing flow is used with a medical imaging system. However, methods for representing flow with medical imaging systems were exceedingly well known in the art. For example, Yoshiya discloses a method for representing flow with a medical imaging system [page 2 of translation].

Kawaguchi and Yoshiya are combinable because they are both concerned with flow imaging systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Kawaguchi in view of Yoshiya. The reason for doing so would have been to enhance the flexibility of the flow display system. Therefore, it would have been obvious to combine Kawaguchi with Yoshiya to obtain the invention as specified in claim 1.

Referring to claim 2, Kawaguchi discloses that step (a) further comprises:

- a1. determining the flow direction (PL) and magnitude (MG) [col. 5, ll. 17-36]; and
- a2. determining the rate of change as a function of the flow direction and magnitude [col. 5, ll. 17-col. 6, ll. 52];

wherein (b) comprises displaying the change as a perceived motion of a pixel [col. 5, ll. 17-col. 6, ll. 52 and figs. 2-3].

Referring to claim 3, Kawaguchi further discloses that step (b) further comprises displaying a pattern for a plurality of pixel locations, the pattern varying as a function of the rate of change [col. 5, ll. 17-col. 6, ll. 52 and figs. 2-3].

Referring to claim 4, Kawaguchi further discloses that step (a) further comprises determining the rate of change as proportional to motion for pixels associated with flow [col. 5, ll. 17-col. 6, ll. 52 and figs. 2-3].

Referring to claim 11, Kawaguchi discloses a method for representing flow, the method comprising:

- a. generating a first pattern for a plurality of pixels associated with flow for a first image [col. 5, ll. 37-col. 6, ll. 2 and figs. 2-3];

- b. determining a spatial offset between the first image and a second image as a function of the flow [col. 5, ll. 37-col. 6, ll. 52 and figs. 2-3]; and
- c. generating a second pattern for the pixels associated with flow for the second image, the second pattern determined as a function of the first pattern, the second pattern being positioned in the second image as a function of the spatial offset [col. 5, ll. 37-col. 6, ll. 52 and figs. 2-3].

Kawaguchi does not explicitly disclose that the method for representing flow is used with a medical imaging system. However, methods for representing flow with medical imaging systems were exceedingly well known in the art. For example, Yoshiya discloses a method for representing flow with a medical imaging system [page 2 of translation].

Kawaguchi and Yoshiya are combinable because they are both concerned with flow imaging systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Kawaguchi in view of Yoshiya. The reason for doing so would have been to enhance the flexibility of the flow display system. Therefore, it would have been obvious to combine Kawaguchi with Yoshiya to obtain the invention as specified in claim 11.

Referring to claim 16, Kawaguchi further discloses that step (c) comprises generating the second pattern as representing movement of the first pattern [col. 5, ll. 37-col. 6, ll. 52 and figs. 2-3].

Referring to claim 18, Kawaguchi further discloses that steps (a) and (c) comprise indicating a direction of flow with a shift of the first pattern to a different position, the second pattern including information from the shifted first pattern [col. 5, ll. 16-col. 6, ll. 52].

Referring to claim 19, Kawaguchi further discloses that steps (a) and (c) comprise indicating a magnitude of flow with a shift of the first pattern to a different position, the second pattern including information from the shifted first pattern [col. 5, ll. 16-col. 6, ll. 52].

Referring to claim 20, Kawaguchi discloses a system for representing flow in medical imaging, the system comprising:

a processor operable to generate an at least partially persistent pattern (figs. 2-3) in each of at least two images (figs. 2-3), the persistent pattern shifted as a function of at least one of flow direction or flow magnitude, the processor operable to calculate a second pattern in the second of the images as a function of a first pattern in the first of images [col. 5, ll. 16-col. 6, ll. 52]; and

a display operable to display the at least two images [col. 5, ll. 16-col. 6, ll. 52].

5. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawaguchi et al., U.S. Patent No. 5,677,501 ("Kawaguchi"), Yoshiya et al., J.P. Patent No. 02-161934 ("Yoshiya"), and Mo et al., U.S. Patent No. 6,733,455 ("Mo").

Referring to claims 13-15, Yoshiya further discloses color flow imaging of Doppler signals (page 1 of the translation), but does not explicitly disclose that (a) comprises modulating gray scale values of pixel display values for the plurality of pixels. Additionally, Yoshiya does not explicitly disclose either the step of modulating a color of the pixel display values for the plurality of pixels as a function of a flow characteristic or the step of modulating the gray scale pixel display values as a function of B-mode signals for the plurality of pixels.

Mo discloses that in color flow imaging, the color flow image is formed by modulating gray scale values of pixel display values for plurality of pixels and by modulating a color of the pixel display values for the plurality of pixels as a function of a flow characteristic, which is written onto a B-mode image (col. 3, lines 5-15).

Kawaguchi, Yoshiya and Mo are combinable because they are all concerned with flow imaging systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Kawaguchi and Yoshiya to include the teachings of Mo. The reason for doing so would have been to enhance a diagnosis process by providing color and gray scale displays. Therefore, it would have been obvious to combine Kawaguchi and Yoshiya with Mo to obtain the invention as specified in claims 13-15.

Allowable Subject Matter

6. Claims 5-10 are allowed.
7. Claims 12, 17 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

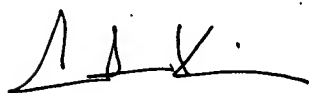
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

Application/Control Number:
10/642,914
Art Unit: 2624

Page 8

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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January 8, 2008